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NORTH AMERICAN WATERFOWL MANAGEMENT PLAN

STRENGTHENING the BIOLOGICAL FOUNDATIONS

2003

Strategic Guidance



*North American Waterfowl
Management Plan*
*Plan nord-américain de
gestion de la sauvagine*
*Plan de Manejo de Aves
Acuáticas de Norteamérica*

Contents

Contents	2
Preface	2
I. A Conservation Legacy	3
II. Commitment to the Future.....	4
III. North American Waterfowl Population Objectives.....	6
IV. Emerging Trends	17
V. Improving Our Scientific Base.....	17
VI. Institutional Organization	19
VII. Challenges	20
VIII. Looking Forward	22

Preface

The North American Waterfowl Management Plan (Plan) was developed in 1986 as the framework for a 15-year effort to achieve the waterfowl population and habitat objectives deemed necessary to meet public demand in North America. Conservation achievements under the banner of the Plan have been phenomenal and today the Plan is a widely recognized conservation success. Nevertheless, some goals of the original Plan remain unfulfilled and new challenges continue to emerge. The need for international cooperation in the conservation of the shared waterfowl resource will continue into the foreseeable future. We believe a renewal of the Plan is warranted.

The Plan Committee has regularly made modifications to the Plan to account for biological, social, and economic changes that influence the status of waterfowl and recognizes the continued importance of waterfowl and wetlands to North Americans. Our intent in preparing the 2003 Plan is to define the needs, priorities, and strategies for the next fifteen years, increase stakeholder confidence in the direction of Plan actions, and most importantly, guide partners in strengthening the biological foundations of North American waterfowl conservation. To achieve all this, the 2003 Plan is presented in two separate documents. This document, ***Strategic Guidance*** is comparable in length and scope to the 1986 Plan and the Updates of 1994 and 1998. It is directed to Plan partners, agency administrators and policy makers who set the direction and priorities for conservation in all three countries. The companion ***Implementation Framework*** provides more detailed discussion of the Plan's themes and includes several appendices of supporting information. It is our hope that the many thousands of partners involved in the conservation of our natural resources will find these documents useful in continuing their work.

(Plan Committee signatures)

I. A Conservation Legacy

The 1986 *North American Waterfowl Management Plan* (Plan) transformed cooperative wildlife conservation. The Plan's predecessors were the species and flyway plans developed by the four Flyway Councils, and later, the national waterfowl management plans developed by the U.S. and Canadian wildlife agencies. These earlier efforts, however, led waterfowl managers to conclude that a comprehensive international plan was needed to properly address the conservation needs of North American waterfowl. The Plan pioneered a shift in waterfowl management from an era dominated by harvest management and site-specific habitat protection to one where waterfowl managers are participants in partnerships building sustainable landscapes across North America.

Waterfowl drew Canada, the United States, and later, Mexico, into a continental conservation effort through the Plan and fostered conservation partnerships encompassing diverse social, economic, and environmental interests. The purpose of the Plan is to sustain abundant waterfowl populations by conserving landscapes, through partnerships, guided by sound science. Through growth and refinement, documented in Plan updates in 1994 and 1998, the Plan has become an approach to conservation defined by 3 broad visions;

“The purpose of the Plan is to sustain abundant waterfowl populations by conserving landscapes, through partnerships, guided by sound science.”

- Plan partners define and attain the landscape conditions needed to sustain waterfowl populations,
- Plan partners forge broad alliances with other conservation efforts and communities to achieve Plan objectives,
- Plan partners continually improve the biological foundations of waterfowl conservation.

Though these visions are being realized across the continent, the information, challenges and opportunities for conservation continue to evolve. The 2003 Update establishes a new 15-year horizon for waterfowl conservation in North America by assessing and defining the needs, priorities, and strategic direction required to guide waterfowl conservation in the 21st century.

The 1986 Plan recognized that wide-ranging degradations to wetlands and associated uplands required a comprehensive response including landscapes improved through public policies, agricultural and forestry programs, and traditional habitat conservation programs. Plan successes have hinged on the ability of diverse interests to create and sustain relationships that improved and expanded the approaches to conserving waterfowl. The array of Plan partners has expanded beyond waterfowl and other wildlife interests to include soil and water conservationists, land and water resource development interests, and, most importantly, local communities and private landowners. Increased recognition of the benefits of sustainability and a landscape approach has

helped Plan partners integrate waterfowl conservation into broader conservation and social contexts.

The following principles are the base for the 2003 Plan and should guide any actions undertaken in its support:

- \$ Waterfowl are among North America's most highly valued natural resources.
- \$ Waterfowl populations should be sustained at objective levels across their natural ranges to provide both ecological and socio-economic benefits.
- \$ Protection of North American waterfowl populations and their habitats requires long-term planning and close cooperation and coordination of management activities in Canada, Mexico, the United States, and other countries important to North American waterfowl.
- \$ Resident and endemic species are important components of each nation's waterfowl heritage and deserve significant attention and resources from within the jurisdictions where they occur .
- \$ Managed subsistence and sport harvests of the renewable waterfowl resource are desirable and consistent with its conservation.
- \$ Joint ventures, partnerships among private organizations, individuals, and government agencies, are the primary vehicle for accomplishing Plan objectives.
- \$ Long-term protection, restoration, and management of waterfowl habitats requires that Plan partners collaborate with other conservation and community efforts in the development of conservation, economic, and social policies and programs that sustain the ecological health of landscapes.
- \$ Plan implementation is founded on sound science and guided by biologically based planning, both of which are, in turn, refined with increased knowledge gained through evaluation and research.

II. Commitment to the Future

Many of the goals in the original 1986 Plan, for some waterfowl species population levels, for acres of habitat conserved, for dollars raised and expended, have been achieved. While the initial 15-year planning horizon has been transcended, the job is far from done. Conservation gains could be transient if pressures that diminish habitat quantity, availability, and quality

“Conservation gains could be transient if pressures that diminish habitat quantity, availability, and quality persist, eroding the accomplishments of the last 17 years.”

persist, eroding the accomplishments of the last 17 years. The challenges are many. Wildlife interests must deal with significant socio-economic and environmental changes that will impact waterfowl conservation for years to come. At the same time, a lack of basic knowledge of population dynamics for some waterfowl species hinders development of effective conservation strategies. To meet these challenges, aggressive conservation efforts are still needed across the entire range of North America's waterfowl habitats. To ensure the Plan's

legacy, Plan partners must continue to address the conservation needs outlined in the 1986 Plan as well as address the new challenges and opportunities of the 21st Century. The subtitle of the 2003 Plan, *Strengthening the Biological Foundations*, reflects the Plan Committee's belief that a strong scientific base underpins everything the Plan does and is vital to the Plan's continuing success in conservation.

The root of all Plan activity is the Plan's waterfowl population objectives. These objectives are based on historic abundances of species and consensus among waterfowl stakeholders on waterfowl numbers needed to ensure population viability and to provide for regulated harvest and other forms of public enjoyment. These objectives can be achieved only through an understanding of the habitat conditions necessary to sustain target population levels. The Plan's biological foundation, therefore, includes waterfowl population objectives, habitat objectives, and an understanding of the linkages between them. It encompasses the ecological understanding of factors that affect the distribution and abundance of waterfowl, and especially the linkages among landscape changes (e.g., water abundance, land use, habitat quality, and Plan conservation actions) and waterfowl birth rates, death rates, and population growth. Our understanding of ecological factors affecting waterfowl populations directs the development and implementation of conservation strategies and actions. Thus, the biological knowledge base is truly the foundation for the Plan's success.

The Plan is a cooperative international endeavor involving governments at all levels, indigenous groups, non-government organizations, corporations, and individuals. The Plan leads by providing a compelling blueprint for action and empowering partners to work within that scientific and organizational framework. Ultimately, the success of the Plan will depend on effective partnerships

“ Ultimately, the success of the Plan will depend on effective partnerships among all sectors of society that have a role in waterfowl conservation”

among all sectors of society that have a role in waterfowl conservation. The Plan is overseen by a committee whose membership represents the agencies responsible for managing waterfowl in Canada, the United States, and Mexico. It is the responsibility of the Plan Committee to provide leadership within the North American waterfowl community by working with Plan partners to assure the quality of Plan activities, advocating for waterfowl conservation policies and programs with appropriate groups, and facilitating communication throughout the waterfowl community.

Joint Ventures were established as the implementation arm of the Plan and have become the preeminent partnerships in the Plan community¹. Collectively, they have marshaled more than U.S. \$2 billion for waterfowl habitat and population conservation needs, including conservation actions on more than 9 million acres. Their proven ability to leverage funding from multiple sources is a prominent asset; less well known is the important role the joint ventures have played in improving the Plan's biological foundations by evaluating conservation planning assumptions and the effectiveness of conservation actions. Another important Plan partnership is the North American Waterfowl Management Plan Science Support Team (NSST), a working group comprised of national-level Federal agency staff, Flyway representatives, and biologists from the

¹ The Plan community is defined as all the agencies, organizations, groups and individuals involved in Plan activities

individual joint ventures. This group was formed to provide technical advice to the Plan Committee, particularly to help strengthen the biological foundations of the Plan and facilitate continuous improvement of Plan conservation programs. Flyway Councils, partnerships of states and provincial wildlife agencies with responsibilities for population management, are represented in the membership of all Plan institutions to ensure the integration of Plan activities with harvest management strategies.

III. North American Waterfowl Population Objectives

North America has forty-eight species of ducks, geese, and swans, most of which depend on habitats in two or more countries to complete their life cycles. Forty-two species are shared among North American and other countries. Two southern species, the masked duck and muscovy duck, are shared between Mexico, Latin American and Caribbean nations, and one species, the emperor goose, is shared between the United States and Russia and various sea duck species move between Alaska, Russia, arctic Canada and Greenland during breeding and nonbreeding seasons. An additional three species are non-migratory endemics of the Hawaiian archipelago. Population objectives have been established for many species, races and populations of waterfowl. Because many waterfowl rely on dynamic habitats, Plan population objectives reflect average population sizes corresponding to a normal range of environmental conditions.

“Population objectives move the Plan beyond a mere concept for wetland conservation by grounding it in the explicit terms of species conservation.”

Plan waterfowl population objectives serve three important functions. First, population objectives move the Plan beyond a mere concept for wetland conservation by grounding it in the explicit terms of species conservation. Second, explicit population objectives provide a framework for organizing cohesive regional planning efforts and for gauging their success. Third, comparison of population objectives with monitoring data provides an objective assessment of the status of North American waterfowl.

The Plan’s population objectives are intended to be simple and easy to communicate. They are reviewed for consistency with other North American waterfowl management objectives, such as those developed by the Flyway Councils. Finally, all Plan population objectives are quantitative and can be compared to the results of operational monitoring programs.

A general objective of the Plan since its inception in 1986 has been to maintain or restore traditional distributions of waterfowl in North America, consistent with long-standing patterns of

waterfowl utilization. It is also recognized that managed harvest of waterfowl is desirable and consistent with conservation. Waterfowl harvest management and habitat conservation are interrelated pursuits, and their success is mutually reinforcing. Thus, they should be guided by complementary objectives consistent with long-term population viability and with human use of the waterfowl resource.

We define two terms for the purposes of this Plan.

Population: a non-specific term which, depending on the context, refers to a group of birds of one or more species (e.g., the North American scaup population refers to the continental population of both greater and lesser scaup) and/or races distinguished for management or conservation purposes. Management does not necessarily imply harvest management and may refer solely to habitat conservation planning and implementation.

Race: refers to a taxonomically distinct sub-species.

Breeding duck population objectives are derived from average breeding population levels of the 1970's or species-specific management plans (Table 1) The decade of the 1970's is representative of a range of environmental conditions in the prairie-parkland region. Duck populations during this decade were generally thought to meet the demands of both consumptive and non-consumptive users. Of the 14 species, species groups, or races for which goals have been established, 11 have stable or increasing long-term trends in abundance.

Table 1. Breeding population objectives, recent status, and long-term trends for ducks (1,000s of ducks).

Species/Species Group/Race	Objective ^a	Average Population Size (1993-2002) ^b	Long-term Trend (1970 – 2002)
Mallard	8,200	8,416	Stable
Northern pintail	5,600	2,765	Decreasing
American black duck	640 ^c	381 ^c	Decreasing ^d
Mottled duck, Florida Race ^e	9.4 ^f	11 ^f	Increasing ^g
Gadwall	1,500	2,884	Increasing
American wigeon	3,000	2,578	Stable
Green-winged teal	1,900	2,386	Increasing
Blue-winged and cinnamon teal	4,700	5,642	Stable
Northern shoveler	2,000	3,161	Increasing
Hawaiian Duck ^e	5,000	2,500 ^h	Stable ^h
Laysan Duck ^e	10,500	300 ^h	Stable ^h
Redhead	640	796	Stable
Canvasback	540	648	Stable
Lesser and greater scaup	6,300	4,051	Decreasing

^aDuck objectives are based on the Waterfowl Breeding Population and Habitat Survey, Traditional Survey Area (WBPHS-TSA) strata 1-18,20-50,75-77 and represent average population estimates from 1970-1979, unless otherwise noted.

^bAverage population size estimates are for the WBPHS-TSA unless otherwise noted.

^cThe American black duck population objective was developed from the predictions of a model relating Mid-winter Waterfowl Survey counts to population estimates derived from the Breeding Waterfowl Plot Survey (BWPS) of Eastern Canada. The objective corresponds to that portion of the black duck breeding range sampled during the BWPS. The average population size presented for black ducks also is derived from the BWPS and is for the period 1993-2001. For management purposes, the black duck objective has been partitioned for 3 portions of the breeding range: eastern, central, and western. In the future, combined estimates from fixed-wing and helicopter surveys will be evaluated for monitoring and objective setting for this species.

^dBased on Mid-winter Survey data.

^eNot shared between two or more signatory nations. Management is the responsibility of that nation whose boundary coincides with the range of the species, sub-population, or race.

^fThe mottled duck, Florida Race objective corresponds to that portion of this race's breeding range sampled by the Florida Mottled Duck Survey (FMDS). The objective for the Florida Race of mottled ducks is based on average population size estimates from 1985-1989. Reported average population size is for the time period 1994-2000.

^g1994-2000.

^hHawaiian species are monitored by the Annual Hawaiian Waterbird Survey. Mean population estimates correspond to the years 2001 – 2002.

Table 2. Breeding duck population estimates and trends in North America (1,000s of ducks).

Species/Sub-Population/Race ^b	1993 – 2002			Long-Term Trend (1970– 2002)
	Mean Population Estimates ^a			
	Continental	Traditional Survey Area ^c	Other Survey Areas ^c	
Mallard	13,000	8,416	3,361	Stable
Mexican duck ^d	56	Not Applicable	Not Applicable	Increasing ^e
Northern pintail	3,600	2,765	161	Decreasing
American black duck	910	34	381 ^f	Decreasing ^e
Mottled duck	660	Not Applicable	11	Stable ^e
Florida race ^d	30	Not Applicable	11 ^g	Increasing ^g
Western Gulf Coast race	630 ^h	Not Applicable	Not Applicable	Stable ^e
Gadwall	3,900	2,884	449	Increasing
American wigeon	3,100	2,578	383	Stable
Green-winged teal	3,900	2,386	612	Increasing
Blue-winged and cinnamon teal	7,500	5,642	900	Stable
Blue-winged teal	7,240	Not Differentiated	649	Stable
Cinnamon teal	260	Not Differentiated	30	Stable ^e
Northern shoveler	3,800	3,161	267	Increasing
Hawaiian Duck ^d	2,500	Not Applicable	2,500	Stable
Laysan Duck ^d	300	Not Applicable	300	Stable
Wood duck	4,600	Not Applicable	653	Increasing ^e
Eastern population	4,400	Not Applicable	629	Increasing ^e
Western population	200	Not Applicable	24	Increasing ^e
Muscovy duck ^d	30	Not Applicable	Not Applicable	Decreasing ^e
Whistling ducks	215	Not Applicable	Not Applicable	Increasing ^e
Fulvous whistling duck	Unknown	Not Applicable	Not Applicable	Increasing ^e
Black-bellied whistling duck	Unknown	Not Applicable	Not Applicable	Increasing ^e
Redhead	1,200	796	217	Stable
Canvasback	740	648	50	Stable
Scaup	5,200	4,051	525	Decreasing
Lesser scaup	4,400	3,484 ⁱ	525	Decreasing ^f
Greater scaup	800	568 ⁱ	Not Applicable	Stable ^f

Species/Sub-Population/Race ^b	1993 – 2002			Long-Term Trend (1970– 2002)
	Mean Population Estimates ^a			
	Continental	Traditional Survey Area ^c	Other Survey Areas ^c	
Ring-necked duck	2,000	1,065	679	Increasing
Ruddy duck	1,100	566	189	Increasing
Masked duck ^d	6	Not Applicable	Not Applicable	Unknown
Harlequin duck	252	Not Applicable	17	Stable ^e
Eastern population	2	Not Applicable	Not Applicable	Stable ^e
Western population	250	Not Applicable	25	Stable ^e
Long-tailed duck	1,000	171	112	Decreasing ^e
Eiders	1,643	11	27	Decreasing ^e
King eider	575	Not Differentiated	Not Applicable	Decreasing ^e
Common eider	1,050	Not Differentiated	Not Applicable	Decreasing ^e
American race	300	Not Differentiated	Not Applicable	Decreasing ^e
Northern race ^d	550	Not Differentiated	Not Applicable	Decreasing ^e
Hudson Bay race ^d	100	Not Differentiated	Not Applicable	Decreasing ^e
Pacific race	100	Not Differentiated	5	Decreasing ^e
Steller's eider ^d	1	Not Differentiated	1	Decreasing ^e
Spectacled eider ^d	17	Not Differentiated	17	Decreasing
Scoters	1,600	899	15	Decreasing
Black scoter	400	Not Differentiated	Not Applicable	Decreasing ^e
Surf scoter	600	Not Differentiated	1	Decreasing ^e
White-wing scoter	600	Not Differentiated	14	Decreasing ^e
Goldeneyes	1000	749	223	Stable
Common goldeneye	750	Not Differentiated	43	Stable
Barrow's goldeneye	250	Not Differentiated	180	Stable ^e
Eastern population	5	Not Differentiated	Not Differentiated	Stable ^e
Western population	250	Not Differentiated	180	Stable ^e
Bufflehead	1,400	931	358	Increasing
Mergansers	1,600	699	794	Increasing
Hooded merganser	350	Not Differentiated	230	Increasing ^e
Red-breasted merganser	250	Not Differentiated	9	Increasinge
Common merganser	1,000	Not Differentiated	235	Increasinge

^a Traditional Survey Area estimates were derived from the Waterfowl Breeding Population and Habitat Survey (WBPHS), strata 1-18, 20-50, 75-77. Other Surveyed Area estimates were derived from some combination of WBPHS strata (51-57, 62-69), the Breeding Waterfowl Plot Survey also conducted in eastern Canada, and concurrent state, provincial, or regional breeding waterfowl surveys in British Columbia, California, Colorado, Connecticut, Delaware, Florida, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, Nevada, New Hampshire, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming. In cases where a survey was not completed every year between 1993 and 2002, or when data were unavailable, mean estimates were computed using available estimates for that time period. Continental estimates include the surveyed area estimates as well as rough estimates of populations outside of surveyed areas based on harvest derivation studies, expert opinion, winter survey data, or special purpose research surveys. Continental estimates for species such as the muscovy, whistling ducks, masked duck, and many sea ducks are based on few data and are particularly speculative.

^b Sub-populations are identified distinctly when there is significant evidence for allopatry. Races are also distinguished according to current taxonomic classification and refer to genetically distinct sub-species. The taxonomic delineation presented in this table is intended to aid in development of regional habitat conservation strategies and is not intended to supercede other international agreements regarding the appropriate organizational level for species management.

^c "Not differentiated" indicates that the survey protocol does not enable discrimination to a particular taxonomic level. "Not applicable" indicates that the species, race, or sub-population is not recorded in the WBPHS Traditional Survey Area or in the surveys represented by the Other Surveyed Area Category.

^d Not shared among two or more signatory nations. Management is the responsibility of that nation whose boundary coincides with the range of the species, sub-population, or race.

^e Trend estimates based on a variety of data sources (e.g., Mid-winter Survey, Breeding Bird Survey, published accounts) other than breeding population estimates from the WBPHS. In general, less confidence is attributed to these estimates.

^f 1993-2001.

^g 1994-2000.

^h Winter population estimate.

ⁱ Estimate of lesser scaup in the traditional survey area was computed from non-tundra WBPHS strata 1-7, 12, 14-18, 20-50, 75-75. Estimate of greater scaup in the traditional survey area was computed from tundra strata 8-11 and 13. These can be considered only crude estimates since some mixing of lesser and greater scaup occurs in tundra and northern boreal strata.

The Plan recognizes 35 populations within 7 species of geese and establishes goals for 28 populations. Goose populations occupy traditional breeding and wintering grounds each year and move between these areas using traditional migration corridors. These movements subject individual populations to distinct factors influencing recruitment and mortality and frequently warrant population-specific management planning. Consequently, the Plan includes objectives for numerous populations of Canada geese, snow geese, white-fronted geese, and brant. (Table 3). These populations have been delineated for management purposes and may include members of more than one race for some species. Plan population objectives for geese were drawn from existing goose population management plans developed by the Flyway Councils. These plans consider factors such as optimal population size for population maintenance, breeding ground carrying capacity, recreational demand, concerns related to crop depredation, and the potential for disease outbreaks.

Table 3. Status and goals for North American goose populations.

<i>Species/population</i>	<i>Population Mean (2000-2002)^a</i>	<i>Population Trend (1993-2002)^b</i>	<i>Population Objective</i>
CANADA GEESE			
Atlantic	134,900	Increasing	175,000 ^{c,d}
Atlantic Flyway Resident	997,700	Increasing	650,000 ^{e,f}
North Atlantic	No estimate	No estimate	Not yet established
Southern James Bay	89,400	Stable	100,000 ^e
Mississippi Valley	598,600	Stable	375,000 ^e
Mississippi Flyway Giants	1,442,900	Increasing	1,000,000 ^e
Eastern Prairie	235,600	Stable	200,000 ^e
Western Prairie and Great Plains	662,600	Increasing	285,000 ^g
Tall Grass Prairie	316,500	Stable	250,000 ^g
Short Grass Prairie	175,000	Decreasing	150,000 ^g
Hi-Line	246,900	Increasing	80,000 ^g
Rocky Mountain	162,229	Increasing	117,100 ^e
Pacific	No estimate ^h	No estimate ^h	Not yet established
Lesser	No estimate	No estimate	Not yet established
Dusky	17,300	Stable	Avoid ESA ⁱ listing
Cackling	181,700	Stable	250,000 ^j
Aleutian	33,400	Increasing	40,000 ^g
Vancouver	No estimate	No estimate	Not yet established
Taverner's	No estimate	No estimate	Not yet established
SNOW GEESE			
Greater	763,500	Increasing	500,000 ^k
Mid-continent Lesser	2,478,200	Stable	1,000,000 ^g
Western Central Flyway Lesser	114,400	Stable	110,000 ^g
Wrangel Island Lesser	102,500	Increasing	120,000 ^e
Western Arctic Lesser	486,000	Increasing	200,000 ^e
ROSS'S GEESE	619,000	Increasing	100,000 ^e
WHITE-FRONTED GEESE			
Mid-continent	914,300	Stable	600,000 ^j
Tule	5,500 ^l	Stable	10,000 ^g
Pacific	381,200	Increasing	300,000 ^j

BRANT			
Atlantic	161,400	Stable	124,000 ^g
Pacific	132,000	Stable	150,000 ^g
Western High Arctic	No estimate	No estimate	12,000 ^g
Eastern High Arctic ^m	20,000	Stable	Not yet established
EMPEROR GOOSE^m	68,600	Stable	150,000 ^e
HAWAIIAN GOOSE^m	1,175	Stable	2,800 ^e

^a Incomplete survey years were excluded from the computation. Where no estimates are available for 2000-2002, the most recent estimate is presented.

^b Many goose population surveys, particularly breeding ground surveys, have shorter periods of record than surveys established for ducks. For this reason trend estimates are based on a shorter, 10-year, interval, or for the period of record when 10 years of data are not available.

^c Breeding pair index.

^d Objective partitioned: 150,000 pairs Ungava Peninsula; 25,000 pairs boreal Quebec.

^e Total spring population.

^f Reduce to this level by 2005.

^g Winter population.

^h State and provincial surveys exist but it is not yet possible to develop a population-wide index.

ⁱ ESA – Endangered Species Act (United States).

^j Autumn population.

^k Spring population.

^l Population estimates based on neck collar observations during the winter.

^m Not shared among two or more signatory nations. Management is the responsibility of the nation which encompasses the range of the population, sub-population, or race.

No races are recognized for any of the three swan species considered in the Plan. For management purposes, objectives are specified for two populations of tundra swans and three populations of trumpeter swans (Table 3).

Table 4. Status of and goals for North American swan populations.

<i>Species and Population</i>	<i>3-Year Winter Population Mean (2000-2002)</i>	<i>Recent Trend (1993-2002)^a</i>	<i>Population Objective</i>
TUNDRA SWANS			
Eastern Population	101,800	Increasing	80,000 ^b
Western Population	79,500	Stable	60,000 ^b
TRUMPETER SWANS			
Pacific Coast Population	17,551 ^c	Increasing ^d	13,000 ^e
Rocky Mountain Pop.	3,666 (9.1%) ^{c,f}	Increasing ^d	5% annual growth rate ^g
Interior Population	2,430 ^c	Increasing ^d	2,000 ^e
MUTE SWANS	20,000 ^h	Increasing ^h	Not yet established

^a Swan population surveys have shorter periods of record than surveys established for ducks. For this reason trend estimates are based on a shorter, 10-year, interval, or for the period of record when 10 years of data are not available.

^b Winter population

^c 2000 Index from the North American Trumpeter Swan Survey conducted every 5 years.

^d Over the period 1990-2000.

^e Autumn population.

^f Average annual growth rate 1995-2000.

^g Interim objective specified until an abundance objective is adopted.

^h Based on the Atlantic Flyway Mute Swan Mid-Summer Survey and individual state survey data from the Mississippi, Central, and Pacific Flyways.

Relationship of Population Objectives to Habitat Objectives

The Plan specifies its ultimate objectives in terms of the abundance and distribution of North American waterfowl populations. Its goal is to meet population objectives through the wise application of local or regional-scale habitat conservation actions guided by regional habitat conservation objectives. To accomplish this, Plan partners strive to quantitatively link regional waterfowl habitat objectives with continental waterfowl population objectives.

Seventeen years after the inauguration of the Plan, the empirical basis for regional habitat objectives varies widely among joint ventures. The amount of baseline life-history information available for individual waterfowl species varies considerably by geographic region. So does information on resource utilization by waterfowl and environmental influences on bird demography. This disproportionate availability of baseline data is the result of many factors, including the logistical ease and cost of working in different environments, the geographic location of public and private research institutions with waterfowl expertise, geographic differences in the perceived relative importance of waterfowl in relation to other wildlife resources. The joint venture habitat conservation objectives presented in Table 5 reflect this geographic variability in the quantity and quality of scientific information on bird-habitat relationships. While some objectives have been derived and evaluated with the aid of empirical models, others are based more heavily on expert opinion. The ongoing challenge to Plan partners is to develop models for habitat conservation and to evaluate and refine these models to improve habitat conservation strategies. A review of joint venture habitat objectives and the methods used to derive them will be part of the Plan's comprehensive progress assessment scheduled for 2003-2005.

“Plan partners strive to develop models linking regional waterfowl habitat objectives with continental waterfowl population objectives.”

Table 5. Joint Venture Habitat Objectives (acres)

Joint Venture	Protect/Secure	Restore/Enhance
Atlantic Coast	945,000	209,790
Central Valley Habitat	200,000	734,555
Eastern Habitat	1,435,230	1,221,550
Gulf Coast	1,129,972	921,016
Intermountain West	1,500,000	1,000,000
Lower Mississippi Valley	407,000	2,046,000
Pacific Coast	249,000	108,000
Playa Lakes	51,000	35,000
Prairie Habitat	6,672,240	-
Prairie Pothole	1,891,315	4,409,398
Rainwater Basin	50,000	38,333
San Francisco Bay	107,000	129,000
Upper Miss./Great Lakes	758,572 ²	-

² Habitat Objective is to conserve additional acres through securement, protection, restoration and enhancement

Figure 1.



The 1986 North American Waterfowl Management Plan identified prairie pothole breeding habitat in Canada and the U.S. as “the top priority for protection.” In the future, Plan success or failure will continue to be linked to long-term trends in habitat conditions in the Prairie Pothole Region. The 1986 Plan also identified other regions with critical habitat conservation needs for waterfowl. As the biological foundation for waterfowl conservation has improved, and as Plan horizons have expanded to embrace the full spectrum of North American waterfowl, additional priority areas in all three countries have been recognized as critical to the continued maintenance of ducks, geese, and swans throughout the annual cycle. While habitat conservation, or monitoring, is important in every area of the continent, these areas require special attention and resources.

IV. Emerging Trends

For more than 100 years, waterfowl conservation in North America has adapted to changing environmental, economic, social, and political forces. Continuing fundamental shifts in these forces and other factors, especially the trend toward the globalization of human society, demands the constant attention of Plan partners. It must be recognized that these external factors have the potential for substantial impacts, both positive and negative, on the landscapes supporting North American waterfowl.

The societal benefits of healthy waterfowl populations - recreational, economic, cultural, and environmental - were the impetus for the 1986 Plan and are essential for future public support. Hunters have traditionally supported the Plan's mission and will continue to be a primary stakeholder in Plan activities. However, in preparing for the future, Plan partners must be cognizant of emerging societal trends that may change public demand and political support for conservation, affecting the ability of agencies to focus effectively on waterfowl conservation needs. The Plan community needs to monitor and consider the strategic implications of these changes to ensure that the Plan remains relevant well into the new century.

Population growth, increasing demands for energy, water, food, and fiber; urban expansion; invasive species; and global climate change set the context for our waterfowl conservation efforts. Although details of the specific nature, magnitude, and extent of these threats and their implications for conservation remain uncertain, it is clear that some significant changes will occur. Conservation strategies for the future need to consider the negative effects of these pressures to the degree that they result in further habitat loss and degradation. At the same time, some of these forces are also creating new conservation opportunities. For instance, increasing concerns over adequate supplies of clean water have lead to synergies between Plan partners and local governments, highlighting the potential for Plan activities to provide multiple benefits to society. Plan partners need to monitor and evaluate the data from these global trends – and then act on what is learned – in order to limit negative impacts and to take advantage of potential benefits for waterfowl conservation.

V. Improving Our Scientific Base

Because of a rich scientific history and extensive practical management experience, the Plan is fortunate to have a broad base on which to build conservation plans. This varies greatly, however, among species and regions. For instance, we know a great deal more about mid-continent mallards than we do about king eiders in the central Arctic or masked ducks in Mexico.

Regardless of the Plan's strong positioning, waterfowl live in an ever-changing world and their habitats are under unrelenting pressure from human development. Consequently, managers are challenged to make conservation decisions and investments in the face of much uncertainty about the impact of their actions on waterfowl populations. Plan partners are challenged to improve the biological foundation on which key conservation decisions depend and to continuously improve their work through adaptive management.

For the purposes of the Plan, adaptive management is described as the process of using iterative cycles of planning, implementation, and evaluation to improve management performance. Under this concept, Plan managers design conservation activities to have significant impact, but also treat them as opportunities for learning to inform future management decisions. To manage adaptively, managers must be able to articulate clear, quantifiable objectives for each conservation program; predict the biological outcomes of management actions; design and implement monitoring procedures to measure those outcomes, and compare outcomes with the original objectives. Knowledge gained or refined during one cycle is then used to adjust future planning and implementation. The monitoring and evaluation components may vary from simple monitoring of the results of routine management to rigorous experimental delivery of alternative management options.

Significant gaps remain in basic information on the ecology, abundance, and trends of many waterfowl populations, especially sea ducks and resident ducks in Mexico. Programs to track population trends are lacking or inadequate for several species, preventing establishment of meaningful population objectives for all species. Population monitoring capabilities must be increased to detect real changes in waterfowl abundance and gauge those changes against target objectives. Joint ventures need to develop and maintain monitoring and assessment systems capable of discerning habitat changes over time (including Plan actions) at appropriate spatial scales. This information is needed by joint ventures and the NSST to develop a better understanding of how specific habitat changes affect waterfowl recruitment and survival. Some obvious needs include more frequent and comprehensive monitoring of land use changes in the Prairie Pothole Region and reliable population monitoring of the major waterfowl migration areas and wintering grounds.

Because the Plan works continentally, regionally, and locally, adaptive management and strategic planning must also occur at multiple spatial scales. The spatial scale determines the relevant questions, challenges, opportunities for learning, and possible inferences. It is important to appreciate these differences while attempting to provide information relevant for decision-makers at all levels. For example, the Plan Committee requires analyses to help it prioritize activities at a continental scale, while a habitat joint venture manager would be more concerned with understanding the relationship between regional habitat variables and waterfowl populations. But, data gathered at the joint venture level for local decision-making will also

“ Improving the cost-effectiveness of Plan actions, and strengthening the scientific underpinnings of waterfowl plans, are key to maintaining the Plan's leadership role in conservation. ”

help inform continental prioritization. Managers at all levels benefit from efficient information sharing.

The Plan community is committed to improving scientific information where it is lacking and integrating the best possible science into the Plan's decision support systems from continental to project scales. The capacity of joint ventures and other implementing partners need to be improved to provide the best possible understanding of population and landscape trends and the biological effectiveness of Plan actions. Local data gathering, in turn, will help guide continental assessment. Improving the cost-effectiveness of Plan actions, and strengthening the scientific underpinnings of waterfowl plans, are key to maintaining the Plan's leadership role in conservation

VI. Institutional Organization

The Plan is an international effort that is unprecedented on the continent. This voluntary effort requires leadership at different levels, including the Plan Committee and its Science Support Team, individual joint venture management boards, Flyway Councils, the Mexican Advisory Subcommittee on Waterfowl and a host of regional and local groups. These institutional arrangements transcend a diversity of political structure, culture, and language and have allowed continuous growth under the Plan over the past 17 years.

The lead body for the Plan is the International Plan Committee and is comprised of representatives from Canada, the United States, and Mexico. Plan administration is undertaken through the North American Bird Conservation Council in Canada, the Fish and Wildlife Service in the U.S., and the General Directorate of Wildlife of the Secretariat of Environment and Natural Resources in Mexico.

While such agencies provide guidance and long-term management of the Plan, it is the network of partnerships that connect the various elements of the waterfowl community. The Plan partners all have important roles in attaining the vision and goals of the Plan. The nexus of these efforts is the regional joint ventures in Canada and the U.S., and a variety of local partnerships in Mexico. These self-directed regional groups connect diverse programs aimed at migratory bird, multi-species, and habitat conservation on public and private lands. Organized regional partnerships are still emerging in Mexico. The developing National Strategy for the Management of Waterfowl and Their Habitats in Mexico identifies regions for waterfowl management purposes that could, in the future, become joint-venture-style organizations.

Vision, leadership, sufficient resources and continuity are all essential for success. But without sound science, biological monitoring, and adaptive feedback, conservation of species will not be effective. The Plan's Science Support Team, Flyway Councils, and the technical committees

from joint ventures and other partnerships are critical to strengthening the biological foundation of the Plan.

Over the next fifteen years it is imperative that these different administrative and technical groups be in close communication and work together to achieve the Plan's visions and objectives. Efforts short of this will impede waterfowl conservation success.

VII. Challenges

The cost of conserving the full spectrum of North American waterfowl and their habitats will be many billions of dollars, far beyond the means of traditional waterfowl conservation resources. Funding increases are needed but are not the complete remedy. History shows it is possible to use the Plan's broad partnerships to reach out to other interests, integrating the needs of waterfowl with other socially-desired outcomes like clean water, clean air, and sustainable food, fiber, and energy. In this way, waterfowl conservation funds can be leveraged with the billions of dollars expended annually for these other interests. Plan partners possess a compelling tool for shaping future policies and programs. That tool is the Plan's strong scientific foundation, specifically the ability to determine the type, amount, and location of management actions required to achieve desired population objectives.

The challenge for the Plan community is three-fold: 1) to direct available funds where they can be used most efficiently, 2) to capture the potential waterfowl benefits of a host of federal, state, and provincial programs, and 3) to improve the scientific knowledge necessary to achieve Plan goals.

To meet this challenge, the following actions are necessary::

Plan leaders, on the Plan Committee, on joint venture Management Boards, in Federal, State and Provincial governments, and in private institutions should:

- Strive to acquire resources to realize the Plan's visions and accomplish the recommendations of this Update.
- Foster appropriate linkages with other governmental and nongovernmental entities that affect waterfowl habitats in priority North American landscapes and develop effective liaison across other sectors of the economy.
- Foster appropriate linkages with areas outside of North America that are important to some species of North American waterfowl (e.g. Russia, Greenland, Latin America, and the Caribbean).
- Recognize, monitor, and address emerging social, economic, and environmental trends and seek cooperative opportunities for waterfowl conservation .
- Address the persistent deficiencies in breeding habitat in the mid-continent prairie

region.

- Address conservation needs in the boreal forest, which has emerged as a high priority area.
- Complete and implement the Mexican Plan for Waterfowl and Their Habitats

At the technical level, Joint Ventures, the NSST, and other Plan partners should:

- Identify significant limiting factors for species or populations of waterfowl exhibiting long-term population declines.
- Develop and use adaptive processes of biologically-based planning and evaluation to ensure that habitat work targets priority conservation needs of waterfowl, wherever they occur.
- Improve our knowledge of the linkages between habitat dynamics and waterfowl responses in order to design and deliver more effective waterfowl conservation programs and promote supportive public policies.

The Plan community needs to consider whether the Plan's present organizational "form" matches its desired future "function," as detailed in this document and should:

- Examine Plan Committee roles and responsibilities, culminating in a look at Committee structure and membership.
- Strengthen scientific and operational linkages and coordination among habitat joint ventures; between habitat and species joint ventures; and among the Plan Committee, Flyways, the NSST, and all the joint ventures.

NAWMP Progress Assessment 2004-2005

To ensure that the Plan is on course to fulfilling its purpose, the Plan Committee, with the support of the NSST, and in cooperation with the species and habitat joint ventures, will undertake a comprehensive assessment of progress toward Plan goals. This will include an update of regional habitat objectives based on evaluation results, identification of additional science support needs, and a refined estimate of the resources needed to accomplish Plan objectives. The assessment also will solidify strategic biological planning, implementation and evaluation throughout the Plan community and renew the working relationships between the Plan Committee and the joint ventures.

It is vital that all the key Plan stakeholders participate in some manner in this review. The Plan Committee should provide international leadership in this endeavor with technical support from its Science Support Team. The joint ventures, in particular their technical committees, and associated Flyway Councils should also be full participants in the work.

The scope and process for this assessment will be elaborated in a workshop of Plan stakeholders during the winter of 2004. The assessment should begin in 2004, with a final report for the Plan

community by the end of 2005.

The results of this comprehensive assessment will help the Plan Committee and its partners set the stage for the 2008 Update, helping to clarify the top priority needs going forward.

VIII. Looking Forward

Partners in the North American Waterfowl Management Plan are pursuing a proven path for conservation success. Conservation at landscape scales, supported by broad partnerships, and guided by sound science has achieved more in the past 17 years than the Plan's founders could have imagined.

There is much to celebrate about these unprecedented accomplishments. Yet, old challenges, like improving duck recruitment in Prairie Canada persist, while new challenges, like sustaining waterfowl in the boreal forest, and initiating a national waterfowl management program in Mexico, lie ahead. Circumstances have changed, but waterfowl today face an array of pressures that are just as imposing as those faced in 1986.

With this Update, the Plan community reiterates its unwavering commitment to waterfowl conservation, and particularly to the central role of science in guiding Plan actions. The adaptive processes advocated here offer a clear path to success, even in the face of ecological and social uncertainties.

Our continent's spectacular waterfowl have a bright future if we continue to strive on their behalf. We have a solid Plan. We have a history of achievement. The vision of waterfowl in abundance is now ours to secure.